SaskPower is involved with a variety of organizations to help us achieve our *climate change* goals.

Gold

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1 EXECUTIVE SUMMARY

SaskPower's 2001 Climate Change Action Plan Progress Report summarizes the results of our activities and initiatives in reducing greenhouse gas (GHG) emissions this past year. Since our 2000 Climate Change Action Plan Progress Report, we have made some revisions to our Voluntary Challenge and Registry (VCR) Inc. reporting methodology, intended to make our reporting more detailed and precise.

Assuming that SaskPower must reduce GHG emissions in compliance with the Kyoto Protocol to 6% below 1990 levels by 2008-2012, our climate change goal is to achieve 20% of our Kyoto gap by the end of 2003. This would result in a carbon dioxide (CO_2) reduction of approximately 1.3 million tonnes. However, as the demand for generation continues to increase in Saskatchewan, we will have to work hard to achieve increased GHG reductions.

In the short term, SaskPower will have to rely on offsets to reduce GHG emissions. Until commercially viable technology is developed, the use of offsets will contribute to the need to preserve the integrity of the environment, while providing customers with cost effective electricity. To help achieve our climate change goal, SaskPower is actively involved with organizations that will help us develop policies, reduce emissions and research offset opportunities for the future. Organizations that we are currently involved with include the Canadian Electricity Association (CEA), the Greenhouse Gas Emission Reduction Trading (GERT) Pilot, and the Greenhouse Emissions Management Consortium (GEMCo). It is our continued involvement with organizations such as these that will allow SaskPower to build on our commitment in the years ahead.

In 2001, SaskPower reduced or offset GHG emissions by 580,000 tonnes. This compares with reductions or offsets of 560,000 tonnes in 2000. Total GHG emissions in 2001 were 13.8 million tonnes of carbon dioxide equivalent (CO_2e). Although this is a 2% increase from the 2000 total of 13.5 million tonnes of CO_2e, we remain below our 1990 greenhouse gas intensity of 1.12 kg/kW.h, reporting 1.07 kg/kW.h in 2001. Fossil fuel intensities have improved because of efficiency improvements and because natural gas use has increased relative to coal. Our system intensity levels have risen in recent years because hydro has contributed a reduced portion of total production due to low runoff.

SaskPower's proactive GHG emission reduction activities in 2001 include:

- exploring new offset opportunities through the GEMCo
- purchase of 11 Megawatts (MW) of wind power from the SunBridge Wind Power Project
- announcement of plans to install an additional 6 MW of wind power in2002
- initiating development of distributed generation projects, including a solar project at the Saskatchewan Science Centre
- ongoing participation in the Canadian Clean Power Coalition (CCPC)
- continued support for the University of Regina's International Test Centre for Carbon Dioxide Capture, including a demonstration project at the Boundary Dam Power Station
- improving the efficiency of our thermal generation and hydroelectric generation stations

Actions such as these help SaskPower find new ways to reduce our GHG emissions and maintain our commitment to protect the environment while providing our customers with safe, reliable and cost-effective sources of electricity. We remain focused on achieving GHG reductions that will allow us to reach our climate change goal.

2 ORGANIZATION PROFILE

SaskPower was created as the Saskatchewan Power Commission in 1929 with the mandate to deliver safe, reliable and cost-effective power to the residents of Saskatchewan. SaskPower was incorporated as a provincial Crown corporation in 1950, and is governed by the Power Corporation Act of Saskatchewan.

SaskPower operates a network of 14 generating stations and over 150,000 kilometres of transmission and distribution lines. We serve more than 432,000 customers over 526,600 square kilometres of diverse terrain. With a net generating capacity of 2,889 megawatts (MW), SaskPower generates electricity from three coal-fired thermal stations, one natural gas-fired thermal station, seven hydroelectric stations, and three gas turbine plants located around the province.

SaskPower is committed to operating in a manner that helps protect the environment today and for future generations. To act on this commitment, SaskPower provides sound planning and training to ensure that we meet environmental laws and regulations, and that our employees are aware of these laws and regulations. To help minimize the impact of our operations on the environment, SaskPower is involved in a range of initiatives, such as implementing an ISO 14001-compliant environmental management system (EMS), participating in the Action by Canadians (ABC) program, and growing and distributing tree seedlings through our Shand Greenhouse.

3 SENIOR MANAGEMENT SUPPORT

3.1 Signed Statement of Endorsement

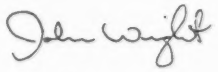
On behalf of SaskPower, I am pleased to submit our 2001 progress report to the Voluntary Challenge and Registry (VCR) Inc.

This report, our eighth since 1995, reflects SaskPower's ongoing commitment to the principles and objectives of the VCR program as we work to balance Saskatchewan's energy needs with a sustainable environment.

In keeping with our proactive approach to the climate change issue, our goal is to achieve 20% of our Kyoto gap by the end of 2003. This goal prepares SaskPower for possible regulations limiting GHG emissions, and will result in a CO_2 reduction of approximately 1.3 million tonnes by 2003.

The following report details our progress toward that goal as we reduced or offset in excess of 580,000 tonnes of GHG emissions in 2001. We have undertaken a broad base of activities, both internally and with our business and community partners, in support of our commitment to voluntary action, and we work hard to achieve the highest standards of reporting to ensure that our results are accurate and verifiable.

Climate change is a complex, challenging issue – for our industry, our nation and the global community. At SaskPower, we remain committed to taking a lead role in developing solutions that will benefit the generations to come.



John Wright
President & CEO
SaskPower

3.2 Internal Practices and Management Systems Dealing with Climate Change

The United Nations has declared climate change as a serious issue with a wide range of impacts. SaskPower recognizes the magnitude of this issue for the environment and our business operations, which is why we are undertaking actions that will help reduce emissions and educate employees and the public about climate change issues. We are looking to the future for new energy-efficiency and GHG-offset projects to decrease our emissions and discover additional reductions.

SaskPower has successfully implemented an ISO 14001-compliant environmental management system (EMS) throughout the corporation. The EMS allows SaskPower to better control the environmental aspects of our business, while ensuring that we comply with all applicable environmental laws and regulations. SaskPower began registration to the standard with the Boundary Dam Power Station in 1999, with all areas of the corporation achieving registration in 2000.

Regular reporting to senior management is another method of ensuring that SaskPower is making progress toward our climate change goal. Results are reviewed to ensure we are on target to reach our goal and to see if any changes or improvements can be made that will allow us to achieve better results in the future. An internal climate change committee meets regularly to coordinate climate change efforts and activities between departments, discuss issues, and communicate strategies for SaskPower's direction on climate change. This committee involves employees from three areas within SaskPower: Power Production, Customer Services and Environmental Programs.

4 BASE YEAR QUANTIFICATION

4.1 Methodology

SaskPower's GHG emissions consist of approximately 99.2% CO_2, 0.7% N_2O, and small amounts of CH_4. CO_2 is used as the standard unit of measurement for emissions, since it is the primary GHG in the electrical industry. GHG are converted to a CO_2 equivalent (CO_2e) using the following global warming potentials (GWP), which were revised by the Intergovernmental Panel on Climate Change (IPCC) for 2001: $CO_2 = 1$, $CH_4 = 23$ and $N_2O = 296$.

We have chosen to use our actual 1990 GHG emissions as our baseline for emissions reporting purposes. SaskPower's baseline emissions totals were not adjusted even though the baseline year was not representative of typical company operations. In 1990 SaskPower experienced very favourable hydro conditions, which resulted in less thermal production, which, in turn, created fewer emissions.

Similar to last year's report, SaskPower calculates CO_2 emissions from thermal generating stations based on the gross generation versus fuel consumption used in pre-2000 reports. Gross generation provides a more accurate and verifiable level of actual emissions. CO_2 emissions from generation can vary, depending on the properties of the fuel burned and the unit efficiency. Therefore, SaskPower's CO_2 emissions are calculated on an individual unit basis, multiplying the gross generation by the measured gross heat rate. The total carbon produced is then converted into an equivalent amount of CO_2. The CH_4 and N_2O emissions are calculated in a similar manner, by multiplying the gross generation produced by an emissions factor. The factor used will depend on what type of fuel is burned in the plant. All emissions factors used to perform emission estimates and calculations for buildings and vehicles are provided by the 1999 VCR Inc. Registration Guide.

It should be noted that the conversion to a generation based emission calculation was not done correctly in the 2000 Climate Change Action Plan Progress Report. The net, rather than gross, heat rate was used for 2000 resulting in total CO_2e emissions of 14.6 million tonnes. The corrected figure for 2000 is 13.5 million tonnes and other prior years were adjusted accordingly.

SaskPower's VCR Inc. reporting of emissions produced by rural offices, service centres and other buildings used in our operations, such as heated storage yards. Emissions from rural offices and service centres are calculated by multiplying the total natural gas consumption in a given year by the appropriate emissions factor. Emissions resulting from electricity consumption are not included in the emissions from buildings as they are included in the generation emissions. GHG emissions due to natural gas consumption in SaskPower buildings were calculated by multiplying the amount of gas consumed by the appropriate fossil fuel emissions factor.

Emissions due to line losses in our transmission and distribution network are included in generation emissions and are not treated as a separate entry in the tables. SaskPower is also reporting emissions from the injection of CO_2 into the cooling water at Boundary Dam Power Station. This program began in July 1991, with detailed record-keeping beginning in 1992. Records are complete to 1998, with the exception of 1994, where an estimate was used for the consumption figure. In 2001, the CO_2 emission calculation for this project was changed to better reflect what actually occurs. Previous to 2001, CO_2 emissions for this project were equal to CO_2 consumption. However, in 2001 it was noted that only an approximate 50% of CO_2 injected into the water is emitted into the atmosphere. The cooling water absorbs the other 50% of CO_2. All years were recalculated using this methodology.

4.2 Quantification

See Table 10.2 Greenhouse Gas Emissions.

5 PROJECTION

5.1 Methodology

Emissions forecasts for 2002 through 2006 were performed using the following methods:

- Plant emissions were calculated in the same manner as prior years, using estimated generation instead of actual generation;
- Vehicle emissions were calculated in the same manner as prior years;
- Annual fuel consumption is projected to increase by a small percentage;
- Power and natural gas consumption in SaskPower buildings is calculated in the same manner as prior years and is expected to increase slightly.

5.2 Quantification

This report contains GHG emissions projections through the year 2006. Current corporate budgeted estimates have been used in the calculations of future projections to ensure that they are as accurate as possible. The major sources of GHG emissions in SaskPower's operations result from our three coal-fired power stations, three gas turbine plants, and one natural gas-fired thermal station. Indirect sources of emissions for SaskPower include emissions from our fleet vehicles and buildings located throughout the province. Our emissions are composed of the three major GHG's: CO_2, CH_4 and N_2O.

6 TARGET SETTING

6.1 Targets

By developing a voluntary GHG emissions reduction target in 1999, SaskPower has demonstrated our commitment to target setting. This target allows SaskPower to monitor progress in reducing emissions and assess any further actions that may be necessary to reach the target. SaskPower's goal is to achieve 20% of our Kyoto gap by the end of 2003. Our assumed Kyoto target is to reduce net GHG emissions to 6% below 1990 levels for 2008-2012. This translates into a target reduction of approximately 1.3 million tonnes by 2003.

6.2 Process for Target Review and Update

This target is determined in consultation with Environmental Program's Sustainable Development staff and approved by the SaskPower President. Progress towards meeting our target is also updated in reports to management.

7 MEASURES TO ACHIEVE TARGETS

7.1 List of Key Activities/Projects

SaskPower is currently involved with a wide range of activities, both internally and with our business and community partners that will generate reductions to reach our climate change goal. We are also exploring new opportunities for reductions in all areas of the corporation. Some projects are listed simply for informational purposes and do not result in any verifiable GHG reductions for SaskPower. Selected projects are discussed in the following section.

7.1.1 Consumer Initiatives

- Watson and Canora Energy Use Program

In partnership with other organizations, SaskPower tested various energy management concepts in the town of Watson and the district of Canora. The energy reduction measures consisted of water heater add-ons, residential light retrofits, and the use of timers to efficiently operate vehicle block heaters. The program resulted in energy savings of 58,000 kW.h per year.

CO_2 reduction: 50 tonnes/year since 1993

- Saskatchewan Building Energy Management Program

The Building Energy Management Program began in 1996 with start-up funds provided by SaskPower and SaskEnergy. The program involves auditing for possible energy and natural gas savings. Although SaskPower is no longer an active participant, the program continues to exist as a service of the Saskatchewan Research Council (SRC). The SRC operates and promotes the program throughout Saskatchewan.

- Ice Rink Energy Management Program

The Ice Rink Energy Management Program was initiated in 1995 with the intention of assisting municipal ice rinks with their operating costs by way of reducing energy consumption. SaskPower no longer participates in the program, but 163 rinks were audited during the period of our involvement, resulting in identifying potential energy savings of over 1.7 million kW.h/year.

- Health Care Energy Management

In 1994, SaskPower partnered with Natural Resources Canada, SaskEnergy, Saskatchewan Energy and Mines, and Saskatchewan Health to create a pilot project to identify potential energy savings in facilities in two Saskatchewan health districts. The project involved installation of energy-saving devices in the facilities and training of health-care staff in energy management.

- Energy Audits

Between 1990 and 1994, SaskPower offered an energy audit program to help industrial and commercial customers find potential energy savings in their operations. This program resulted in savings of approximately 29 million kW.h of energy and CO_2 reductions of 23,200 tonnes/year.

- SaskPower Energy Solutions

SaskPower Energy Solutions was created in 1999 to help customers reduce energy consumption and costs. This is a demand-side management program with two main products: the Energy Performance Contracting (EPC) Solution and the Transformer Maintenance Solution. SaskPower has entered into an alliance with Honeywell Ltd. to offer EPC. Currently, the program has already identified energy savings for the Legislative Buildings in Regina, provincial buildings in southern Saskatchewan, and several rural school divisions. A total of 70 government buildings and over 25 schools will complete energy saving retrofits in the next year. Additional services may be offered to all customers in the future.

CO_2 reduction: 7,000 tonnes in 2001

- HomeCheck

As a component of SaskPower's energycheck interactive energy information service, homecheck is a residential energy audit computer application accessible over the Internet that allows a SaskPower and/or SaskEnergy customer to determine the electrical and natural gas costs of the major appliances and items in their home. Taking only five minutes to get results, a customer makes selections about their home, appliances, heating and cooling and other major electrical and natural gas items that are specific to their home. The program calculates monthly and yearly dollar amounts and GHG emissions specific to the household. The program provides dollar, kilowatt-hour, cubic meters of natural gas and greenhouse gas savings amounts if customers are looking to upgrade their appliances to the most energy efficient models available. Also, the customer is provided with saving tips about the items selected that will help them reduce their electrical and natural gas consumption and save money. Over 150 electrical and natural gas saving tips are available to the customer when all items in the program are selected. The saving tips provided also link to additional information on the topic. After the customer enters their account numbers, the program provides the customer's previous 12 months of electrical and natural gas consumption and associated greenhouse gas emissions. A set of energy charts allows customers to determine by percentages which group of appliances is using the most energy. The homecheck application and the energycheck information service were available to the public in October 2001 and may be accessed through www.saskpower.com.

7.1.2 Transmission Line Projects

SaskPower has launched several transmission line improvement projects over the past number of years. The largest of these projects is the Condie/QE transmission line. The Condie/QE transmission line is a 230-kV line linking the Condie switching station near Regina and the Queen Elizabeth Power Station in Saskatoon. Completed in 1997, this line was designed to improve transmission reliability and efficiency between power stations in southern Saskatchewan

and load areas in the north. As a result of this transmission line, SaskPower saved an estimated 120 million kW.h of electricity in 2001 due to reduced line losses.

CO_2 reduction: 105,600 tonnes in 2001

7.1.3 Generation Projects

SaskPower is undertaking numerous generation initiatives to improve performance from our generating units. Projects listed are considered changes to the original design or operation of the unit, and not as regular maintenance. Selected projects are discussed in the following section.

- Boundary Dam Boiler/Turbine Optimization

There are a number of initiatives underway to improve the quality of operation of the Boundary Dam boilers and turbines, which will improve heat rate through reduction of slagging and fouling, reduction in soot-blowing losses, and improved boiler and turbine cycle efficiency. These initiatives include fuel quality management, improved soot-blowing strategies, fuel and air distribution system tuning, on-line performance displays and off-line boiler/economizer cleaning.

The estimated heat rate improvement is in the order of 50 kJ/kWh for each unit. The CO_2 reduction was calculated assuming that the improvement in heat rate will occur over a 10-year period at the rate of 10% improvement per year. A significant example of work in this area in 2001 was the implementation of the on-line performance monitoring system on Boundary Dam Units 3, 4, and 5. The on-line performance monitoring system will be implemented on Boundary Dam Units 1, 2, and 6 in 2002.

CO_2 reduction: 17,600 tonnes in 2001

- Boundary Dam Induced Draft Fans

Installation of electrostatic precipitators on Boundary Dam Units 1, 2, 3, 4 and 5 allows the use of more efficient airfoil-type induced draft fans, and results in considerable reductions in fan power consumption. Airfoil induced draft fans were installed on Unit 4 in 1999 and Unit 3 in 2000, at the same time precipitators were installed on these units. Similar fans will be installed on Units 5 and 1 in 2002, and Unit 2 in 2003.

CO_2 reduction: 11,300 tonnes in 2001

- Boundary Dam Unit 6 Turbine Upgrade

Major upgrades of the steam turbine are planned for Boundary Dam Unit 6 in 2003. These upgrades include the replacement of the rotor, blading, diaphragms, seals, and inner casing on the high and intermediate sections of the turbine, and the seals on the low-pressure turbine. This upgrade makes use of advanced blade design technology and advanced steam seal technology, and will result in a 2.5% increase in the efficiency of the turbine.

CO_2 reduction: 49,100/year starting in 2004

- Boundary Dam Unit 6 Primary Air Heater Upgrades

The primary air heater baskets are to be upgraded in 2002, with higher performance baskets. This upgrade is expected to improve the efficiency of the boiler by approximately 0.75%.

CO_2 reduction: 17,100/year starting in 2003

- Poplar River Unit 1 Precipitator Controls

Improvements to the electrostatic precipitator controls for Poplar River Unit 1 were completed in 2000, and power consumption for this equipment was reduced by an estimated 60%.

CO_2 reduction: 4,000 tonnes in 2001

- Poplar River Unit 1 Boiler Upgrade

Upgrades to the boiler of Popular River Unit 1 were completed as part of the major overhaul of this unit in 2001. The work included additional surface area in the superheater and economizer sections of the boiler and redesigned air heater baskets for improved heat recovery.

CO_2 reduction: 10,400 tonnes/year starting in 2002

- Poplar River Unit 2 Boiler Improvements

Major boiler upgrade work on Poplar River Unit 2 turbine is nearing completion. This work includes improved air heater seals, improved economizer performance, mill tuning, burner retrofits, and on-line performance monitoring. The performance of this boiler will continue to be monitored.

CO_2 reduction: 7,500 tonnes in 2001

- Queen Elizabeth Power Station Unit 1 Repowering

Six gas turbines are being installed at the Queen Elizabeth Power Station. The gas turbines are rated to produce 25 MW each and the exhaust from these turbines will pass through heat recovery steam generators, which will supply the steam to the Unit 1 steam turbine. The combined cycle efficiency for the gas and steam turbines will be about 45%, while the cycle efficiency of the existing Unit 1 boiler and steam turbine is only about 30%. The CO_2 reduction was calculated from the improvement in cycle heat rate, the capacity of the unit before the upgrade, and the average capacity factor from 1991 to 2002.

CO_2 reduction: 29,400/year starting in 2003

- Landis Efficiency and Capacity Improvements

The Landis gas turbine was upgraded in 1999 to increase both capacity and efficiency. The reduction in CO_2 was calculated from the improvement in turbine heat rate, the capacity of the turbine before the upgrade, and the average capacity factor from 1991 to 2010.

CO_2 reduction: 5,000 tonnes in 2001

- Island Falls Units 1, 2 and 3 Runner and Transformer Upgrades

The capacity increases resulting from runner and transformer upgrades will result in reduced spilling of water and increased generation from these units, which will then replace other forms of generation. The additional hydro production was assumed to displace CO_2 production at the rate of 0.9 kg/kW.h.

CO_2 reduction: 6,400 tonnes per unit/year

- Coal Plant Condenser Cleanliness

The efficiency of the turbine steam cycle depends on proper cooling of the condenser, and this depends on clean heat transfer surfaces. A number of initiatives have been undertaken to improve condenser cleanliness including, condenser performance monitoring, chemical cleaning

procedures, ball cleaning systems, and CO_2 injection for scaling control on certain units. These initiatives have resulted in an estimated average improvement in heat rate of 75 kJ/kW.h. The CO_2 reductions were calculated assuming that the improvements in condenser cleanliness occurred over a 10-year period.

CO_2 reduction: 80,600 tonnes in 2001

- Cypress Wind Power Project

SaskPower will complete construction of the 5.9 MW Cypress Wind Power Project at the end of 2002. The output of the wind turbines will be offered to customers as Eco-Logo certified green power, a registered trademark of Environment Canada's Environmental Choice Program. The calculation of CO_2 reductions is based on hourly monitoring and displacement of the marginal electricity supply at that time.

CO_2 reduction: 11,800 tonnes in 2003

7.1.4 Other Projects

- Zero Garbage (Zero G) Recycling Program

We have operated our Zero G program since 1993, incorporating offices, generating stations, and transmission and distribution facilities throughout Saskatchewan. Regular waste audits are conducted to measure the volume and types of materials recycled in this program, and to track recycling patterns in our facilities. As in previous years, employees at SaskPower have shown in 2001 their commitment to environmental responsibility by choosing to recycle over 51,000 kg of paper from our head office in Regina. The Zero G program decreases the amount of waste sent to landfills throughout the province, thereby reducing landfill gases, reducing energy use in paper production, and reducing the need for additional tree harvesting for paper production.

CO_2 reduction: 250 tonnes as of 2001

- Head Office Building Upgrade

During 1996 and 1997, the exterior of SaskPower's head office in Regina underwent a number of energy-saving improvements. This project will save on natural gas consumption and costs.

CO_2 reduction: 150 tonnes/year

7.2 Estimated Impact of Activities/Projects

Table 10.1 provides a complete listing of the estimated GHG emission impact of individual SaskPower projects for the period 1990 2006.

7.3 Research and Development

In pursuit of technological solutions, SaskPower is currently taking part in several collaborative research initiatives aimed at the development of clean coal technology.

- Canadian Clean Power Coalition (CCPC)

The CCPC is an industry/government collaborative whose objective is to secure a future for the use of coal to generate electricity. The CCPC will conduct a three-year feasibility study to evaluate and select an appropriate CO_2 removal technology followed by commercial

demonstrations for a retrofit plant (by 2007) and new plant situations. The potential exists for SaskPower to be the host for one of the demonstration projects.

- CANMET CO_2 Consortium

CANMET, a division of Natural Resources Canada, has been conducting pilot scale research work on a CO_2/O_2 recycle combustion concept. The concept will reduce the emissions of CO_2 as well as other emissions from power plants. Preliminary cost estimates indicate this technology would be competitive with amine based approaches to capture CO_2 from existing power plants.

- University of Regina International Test Centre for CO_2 Capture

The University of Regina has established the International Test Centre for CO_2 Capture. Along with its CO_2 pilot plant at SaskPower's Boundary Dam Power Station and facilities on campus, the International Test Centre will investigate methods to reduce the cost of using amines to capture CO_2 from flue gases.

- Weyburn CO_2 Monitoring

PanCanadian is injecting CO_2 into the Weyburn oilfield for enhanced oil recovery. SaskPower is involved in a project with the Petroleum Technology Research Centre to monitor the oilfield to determine the ultimate fate of the injected CO_2.

- Zero Emissions Coal Alliance (ZECA)

Several Canadian and American energy companies are participating in a long term project to develop a series of technologies which would result in the ability to use coal to generate electricity with no emissions, including CO_2. The ZECA technology is still in its infancy but is based on the production of hydrogen from coal.

- Prairie Soil Carbon Balance (PSCB) project

This is a past project to which SaskPower contributed through GEMCo. The PSCB project investigated the science of measuring, monitoring and verifying carbon sequestration in agricultural soil. Sustainable agricultural practices, such as minimal tillage and zero tillage, lead to increases in soil carbon sequestration potential.

8 RESULTS ACHIEVED

8.1 Current Reporting Year

SaskPower's 2001 GHG reductions and offsets totaled more than 580,000 tonnes of CO_2. The use of offsets is a very important part of SaskPower's mitigation strategy, but we also continue to strive for further reductions in customer efficiencies and internal actions, including generation efficiency improvements. A detailed list of GHG reductions and offsets can be found in Table 10.1

8.2 Interim Years

See Table 10.1 for a complete listing of GHG reductions and offsets projects for the period 1990 through 2001.

8.3 Verification

SaskPower does not currently have its GHG reporting verified by an external third-party. However, any data used in performing current and past calculations is maintained on file for internal documentation and verification. Internal verification procedures include validation of calculations, figures, data and methodology used in this report.

8.4 Offsets

In the short term, offsets represent a significant part of SaskPower's GHG emission reduction strategy. An offset project mitigates or sequesters GHG outside the normal operations of SaskPower and our facilities. During 2001, SaskPower continued working toward finding and acquiring new GHG offset opportunities. Offsets may consist of emission reductions, emissions avoidance and carbon sequestration activities. Specific examples of offsets include:

- the preservation and enhancement of carbon stocks such as forests, wetlands and soils that may be in danger of disappearing;
- long-term disposal of GHG through geological sequestration;
- the control or capture of pollution, including the capture and sale of flyash;
- offsetting fossil fuel consumption through the use of low-emissions technology.

SaskPower's goal is to fill 20% of our Kyoto gap by the end of 2003. For now, it is understood that our Kyoto target will be to reduce to 6% below 1990 levels for 2008-2012.

- Flyash Sales

SaskPower International markets the flyash produced by our Boundary Dam and Shand Power Stations to a variety of markets. Flyash is a fine powder by-product of burned coal that can be extracted from exhaust gases, preventing release into the atmosphere. Flyash properties vary between power stations due to the composition of coal burned at each plant. As a cement extender, flyash can be used to make concrete blocks and pipes and ready-mix concrete. It is also used as a fill material in the mining and oil industries. In 2001, SaskPower sold 57,500 tonnes of flyash, and sales are projected to increase to over 87,500 tonnes by 2006.

CO_2 offset: 29,300 tonnes in 2001

- Old Man on His Back Short Grass Prairie and Heritage Preserve

In 1996, SaskPower entered into a partnership with the Nature Conservancy of Canada to create a 13,100-acre prairie and heritage preserve. This preserve is one of the last short-grass prairie communities in the prairie provinces, and is home to a number of endangered species including the ferruginous hawk, burrowing owl, loggerhead shrike, and swift fox. The property also has significant heritage value because of cultural resources in the form of medicine wheels and pastures used by the North West Mounted Police. Grasslands and forests that are kept in a natural state capture carbon from the atmosphere and sequester it in the soil. This project will offset 500,000 tonnes of CO_2 over a 10-year period, beginning in 1996.

CO_2 offset: 50,000 tonnes/year from 1996 to 2005

- Forest Carbon Sequestration Agreement

November 1999 marked the beginning of a new agreement between SaskPower and Saskatchewan Environment that will result in emission reduction credits and environmental benefits by protecting existing carbon reserves and restocking an area classified as "Not-

Sufficiently Restocked". As part of the agreement, between four and five million seedlings are currently being planted. As well the project protected existing forested areas through the creation of forest carbon reserves. These reserves will sequester carbon from the atmosphere, allowing SaskPower to receive carbon offset credits from the agreement. The details of this project are currently undergoing third party verification by GERT. Once verification is completed, SaskPower will be entitled to 22 million tonnes of CO_2 offsets.

CO_2 offset: 2,200,000 tonnes/year from 2003 to 2012

- Surplus SunBridge Wind Power

The 11 MW SunBridge Wind Power Project is a partnership formed by Suncor Energy Inc. and Enbridge Inc. to build, own and operate the wind facility. SaskPower is purchasing the green power generated for distribution to Saskatchewan customers. The majority of the CO_2 reductions realized from this project are transferred to the Federal Government for retirement. The surplus reductions are retired by SaskPower. The calculation of CO_2 reductions is based on hourly monitoring and displacement of the marginal electricity supply at that time.

CO_2 reduction: 2,440 tonnes in 2003

- Ducks Unlimited Canada

January 1997 marked the beginning of a partnership between SaskPower and Ducks Unlimited Canada that will benefit wildlife habitat projects in Saskatchewan. SaskPower became a Diamond Legacy sponsor of Ducks Unlimited by establishing a $1 million, 30-year trust fund that guarantees a minimum annual income of $100,000 for conservation projects. Climate related projects that were funded in the past couple of years include the following:

Pasquia Project - part of the Western Boreal Forest Initiative, one of the project's objectives is to provide baseline ecological data that can be used to detect large scale ecological changes due to a variety of causes, including climate change;

Carbon sequestration studies – the study of carbon cycling in upland and wetland margins and the development of a Prairie Wetland Carbon Model;

In-school education - provides instructors who teach students about the contribution that wetlands make to the environment.

- SaskPower Shand Greenhouse

SaskPower Shand Greenhouse has been in operation since 1991, producing seedlings for distribution throughout Saskatchewan. The greenhouse draws excess heat from Shand Power Station to provide warmth during the winter for the propagation of trees, shrubs, and native plant species. In 2001, although the partnership with TREEmendous Saskatchewan was ended, the greenhouse distributed nearly 490,000 tree seedlings to organizations and individuals within the province. To date, over 2,880,000 seedlings have been grown and distributed. Shand Greenhouse will assume full control over all aspects of distribution of seedlings by 2003. This is an important project for SaskPower because as trees reach maturity, they sequester increasing amounts of carbon thereby creating CO_2 emission reductions.

- GEMCo - Norseman Landfill Gas Projects

The GEMCo is a not-for profit Canadian consortium formed by companies that wish to demonstrate industry leadership in developing voluntary and market-based approaches to GHG emissions management. SaskPower has been a GEMCo member since 1996 and is currently involved in two landfill gas projects coordinated by Norseman Engineering in British Columbia. Both projects collect CH_4 from the Port Mann landfill in Surrey, B.C. and deliver it to different destinations in Surrey by pipeline. The first project delivers the CH_4 to a nearby wallboard plant where the gas is mixed with natural gas to heat burners that cure the wallboard. As a result of this project, SaskPower has access to 23,310 tonnes of CO_2 emission reduction credits over a 14-year period, beginning in 2000. This process prevents the release of CH_4 into the atmosphere and reduces the plant's need for natural gas. The second project is very similar but instead, delivers the methane to a lumber mill where it is used in drying kilns. The old process involved using regular pipeline natural gas. The emission reduction will be created as the methane is burned in the kilns rather than being released into the atmosphere at the Port Mann Landfill. SaskPower will have access to a total of 14,250 tonnes of CO_2e emission reduction credits over the period 2002 to 2013.

First Project CO_2 offset: 1,665 tonnes/year from 2000 to 2013

Second Project CO_2 offset: 2,250 tonnes/year from 2002 to 2013

- Other Offsets

SaskPower currently has several offset projects under development. Given the uncertainty surrounding ratification of Kyoto and potential credit for early action, SaskPower is focusing on projects that have benefits other than GHG offsets. Ancillary benefits may include additional environmental benefits or may involve other aspects of SaskPower's operations, such as distributed generation and use of renewable fuel sources. SaskPower is currently developing other projects that will allow us to reduce our net GHG emissions and contribute to environmental sustainability. Some of these projects are being developed through the GEMCo.

9 EDUCATION, TRAINING AND AWARENESS

9.1 Our Corporate Response to the Climate Change Issue

Climate change is a very important subject for SaskPower and for all Canadians. Ratification of the Kyoto Protocol will have a notable effect on SaskPower, one of the largest fossil-fuel based electricity producers in Canada. In order to minimize the impact of the Kyoto Protocol, we are undertaking voluntary actions to reduce GHG emissions throughout our operations and we are working hard to discover additional areas for achieving reductions. We are also currently exploring new offset opportunities that will help us meet future reduction targets.

To ensure our performance, SaskPower's registration with the ISO 14001-compliant environmental management system (EMS) allows us to better control the environmental aspects of our business, while ensuring that we comply with all applicable environmental laws and regulations.

9.2 Climate Change and Our Employees

Since climate change affects SaskPower's business and the environment, it is important that our employees are informed about this issue. Employees are also informed on what actions SaskPower is performing to reduce emissions and meet future targets. We address our employees

on climate change issues by way of our employee publication, HiLines, and our employee Intranet. We report on some of the actions that SaskPower is undertaking to reduce GHG emissions and how the climate change issue will affect our business operations now and in the future. Employees also have access to annual documents such as the Annual Report, the Environment Review, and the Climate Change Action Plan Progress Report, which discuss climate change issues. Many employees attended climate change workshops through the ABC program, where they learned how to reduce emissions at home, in their vehicles, and in their communities.

9.3 Climate Change and Our External Contacts

SaskPower has been active in promoting climate change issues within Saskatchewan and the Canadian electrical industry. We have participated in voluntary emissions reporting since the inception of VCR Inc. in 1995. As a member of the CEA, SaskPower is involved with an external education and awareness program through the Environmental Commitment and Responsibility (ECR) program. The ECR program requires members to improve environmental performance and allows participation with federal and provincial governments in public policy development and implementation. Through our commitment to regular reporting, SaskPower believes that we set a good example for other organizations within Saskatchewan and the electrical industry.

9.4 Our Public Education on Climate Change

SaskPower participates in public education on climate change issues in a variety of ways. Our involvement as a sponsor of the ABC program is one example of this public education as space was made available for the public to attend the same climate change workshops as SaskPower employees. In addition, the public receives climate change information from SaskPower news releases, our website, SaskPower Energy and Environment Workbooks for schools, and publications such as the Climate Change Action Plan Progress Report, SaskPower Annual Report, and Environment Review. SaskPower also sponsored ten elementary classrooms from rural Saskatchewan, (about 300 students), to attend the Saskatchewan Science Centre's Hot Science: Climate Change Workshop. Children were introduced to the science of global climate change and learned through curriculum-based activities about the issues and solutions relevant to individuals.

10 CLIMATE CHANGE SUMMARY TABLES

10.1 Greenhouse Gas Reductions and Offsets

10.2 Greenhouse Gas Emissions

Table 10 1 Greenhouse Gas Reductions and Offsets

SaskPower

Greenhouse Gas Reductions (tonnes of CO_2)

											ESTIMATED----------						
Internal Reductions	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Consumer Initiatives:																	
Watson/Canora				50	50	50	50	50	50	50	50	50	50	50	50	50	50
SaskPower Energy Solutions											3,000	7,000	7,000	7,000	7,000	7,000	7,000
Transmission Line Projects:																	
Condie/QE								96,000	96,000	105,600	105,600	105,600	105,600	79,200	52,800	52,800	52,800
Lloydminster/Ermine										15,140	15,140	8,800	8,800	8,800	8,800	8,800	8,800
Green Lake/Beauval										6,480	6,480	6,510	6,510	6,510	10,650	15,140	15,140
Prince Albert/La Ronge													5,460	5,460	10,820	17,420	17,420
Swift Current/Maple Creek												176	3,432	4,400	4,400	4,400	4,400
Sandy Bay/Pelican Arrows															5,460	5,460	5,460
Rural Lines						3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Generation Projects:																	
Boundary Dam Waterlance Addition			7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400
Boundary Dam Boiler/Turbine Optimization						2,500	5,000	7,600	10,100	12,600	15,100	17,600	20,200	22,700	25,200	25,200	25,200
Boundary Dam 5 Economizer Rebuild								1,900	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500
Boundary Dam Induced Draft Fans										1,400	7,100	11,300	12,800	17,400	17,600	17,600	17,600
Boundary Dam 6 Primary Air Heater													9,300	17,100	17,100	17,100	17,100
Boundary Dam 6 Turbine														24,600	49,100	49,100	49,100
Shand Replacement of Estevan GS			90,800	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600	181,600
Shand Economizer Addition						5,500	16,500	16,500	16,500	16,500	16,500	16,500	16,500	16,500	16,500	16,500	16,500
Shand Auxiliary Cooling Tower											1,100	1,800	1,800	1,800	1,800	1,800	1,800
Shand Boiler/Turbine Optimization													1,500	3,100	4,600	4,600	4,600
Poplar River 1 Precipitator Controls											700	4,000	4,000	4,000	4,000	4,000	4,000
Poplar River 1&2 Boilers											7,500	13,200	17,900	17,900	17,900	17,900	17,900
Queen Elizabeth Unit 1 Repowering														29,400	29,400	29,400	29,400
Landis Efficiency and Capacity										1,700	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Island Falls 1-3 Turbine/Transformer									19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200
Coal Plant Condenser Cleanliness		8,100	16,100	24,200	32,200	40,300	48,400	56,400	64,500	72,500	80,600	80,600	80,600	80,600	80,600	80,600	80,600
Cypress Wind Power Project														11,800	11,000	10,500	11,400
Other Projects:																	
Recycling Program				50	110	160	220	270	320	370	410	460	500	540	580	620	670
Head Office Upgrade							150	150	150	150	150	150	150	150	150	150	150
Total Reductions:		**8,100**	**114,300**	**213,300**	**221,360**	**241,010**	**262,820**	**371,370**	**410,820**	**455,690**	**487,630**	**501,946**	**530,302**	**587,210**	**603,710**	**614,340**	**615,290**
External Offset Projects																	
Flyash Sales	10,000	9,750	9,600	8,750	13,500	16,500	18,000	31,500	31,800	22,900	22,700	29,300	27,900	31,900	35,500	40,500	44,800
Prairie Conservation							50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Norseman Landfill Gas											1,670	1,670	3,920	3,920	3,920	3,920	3,920
Surplus SunBridge Wind Power														2,440	2,340	2,190	2,370
SERM Agreement														2,200,000	2,200,000	2,200,000	2,200,000
Total Offset Projects:	**10,000**	**9,750**	**9,600**	**8,750**	**13,500**	**16,500**	**68,000**	**81,500**	**81,800**	**72,900**	**74,370**	**80,970**	**81,820**	**2,288,260**	**2,291,760**	**2,296,610**	**2,251,090**
Total Greenhouse Gas Reductions	**10,000**	**17,850**	**123,900**	**222,050**	**234,860**	**257,510**	**330,820**	**452,870**	**492,620**	**528,590**	**562,000**	**582,916**	**612,122**	**2,875,470**	**2,895,470**	**2,910,950**	**2,866,380**

SaskPower

Greenhouse Gas Emissions (tonnes)

												ESTIMATED				
CO_2 Emissions (tonnes)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Generation																	
Boundary Dam	4,924,700	5,063,200	5,334,700	5,157,000	5,829,600	5,929,000	5,907,800	5,964,600	6,101,400	6,194,800	6,197,700	6,513,200	6,383,800	5,983,400	6,210,400	6,339,300	6,167,200
Poplar River	4,602,000	4,560,600	4,732,300	4,394,800	4,426,200	4,519,400	4,398,700	4,639,500	4,667,900	4,464,000	4,527,500	4,418,700	4,496,200	4,520,200	4,477,200	4,150,600	4,465,100
Estevan	283,400	170,400	45,600														
Shand			855,800	1,994,100	2,214,300	2,051,800	2,232,900	2,269,800	2,217,100	2,271,200	2,026,600	2,181,900	2,246,900	2,233,700	2,197,800	2,216,900	2,214,100
Queen Elizabeth	142,100	150,200	355,700	207,000	292,500	303,200	254,400	496,500	647,800	587,000	530,800	452,800	618,900	533,400	566,500	759,600	706,300
Meadow Lake	14,200	28,700	76,000	27,900	30,800	56,000	65,100	59,700	136,800	80,700	51,900	23,500	79,900	25,300	31,300	51,000	44,900
Landis	20,100	6,600	21,800	14,400	15,500	25,600	36,000	58,800	96,700	39,200	66,200	88,100	191,200	74,600	91,100	142,300	153,600
Success	800	4,200	4,900	1,500	600	200	900	3,100	10,100	4,000	6,700	4,000	20,600	6,100	7,700	7,900	3,700
Northern Diesel[1]	1,800	1,700	200	200	500	200	200	300	200	300	300	400	300	400	400	400	400
Cooling Water CO_2 Injection - Boundary Dam			1,400	1,800	1,700	1,500	1,500	500	400	700	1,600	900	800	900	1,000	1,100	1,000
Fleet Vehicles	11,900	11,600	12,400	12,000	12,100	12,500	11,500	10,500	10,100	10,500	10,500	10,600	10,700	10,700	10,700	10,600	10,600
Buildings	5,500	5,700	5,100	5,800	5,500	5,700	6,100	5,600	4,300	4,700	4,600	4,600	4,600	4,600	4,700	4,700	4,700
Total CO_2 Emissions:	**10,006,500**	**10,002,900**	**11,445,900**	**11,816,500**	**12,829,300**	**12,905,100**	**12,915,100**	**13,508,900**	**13,892,800**	**13,657,100**	**13,424,400**	**13,698,700**	**14,053,900**	**13,393,300**	**13,598,800**	**13,684,400**	**13,771,600**
Methane Emissions (kg)																	
Generation																	
Boundary Dam	73,300	75,400	79,500	76,800	86,800	88,300	88,000	88,800	90,900	92,300	92,300	97,000	95,100	89,100	92,500	94,400	91,900
Poplar River	68,500	67,900	70,500	65,500	65,900	67,300	65,500	69,100	69,500	66,500	67,400	65,800	67,000	67,300	66,700	61,800	66,500
Estevan	4,200	2,500	700														
Shand			12,700	29,700	33,000	30,600	33,300	33,800	33,000	33,800	30,200	32,500	33,500	33,300	32,700	33,000	33,000
Queen Elizabeth	2,700	2,800	6,600	3,900	5,500	5,700	4,700	9,300	12,100	11,000	9,900	8,400	11,500	10,000	10,600	14,200	13,200
Meadow Lake	300	500	1,400	500	600	1,000	1,200	1,100	2,600	1,500	1,000	400	1,500	500	600	1,000	800
Landis	400	100	400	300	300	500	700	1,100	1,800	700	1,200	1,600	3,600	1,400	1,700	2,700	2,900
Success		100	100					100	200	100	100	100	400	100	100	100	100
Northern Diesel[1]	200	200	10	10	50	20	20	20	20	30	30	30	30	30	30	30	30
Fleet Vehicles	1,200	1,100	1,200	1,100	1,100	1,100	1,000	900	800	800	700	700	600	600	600	600	600
Total Methane Emissions:	**150,800**	**150,600**	**173,110**	**177,810**	**193,250**	**194,520**	**194,420**	**204,220**	**210,920**	**206,730**	**202,830**	**206,530**	**213,230**	**202,330**	**205,530**	**207,830**	**209,030**
Total CO_2e : (tonnes)	**3,200**	**3,200**	**3,600**	**3,700**	**4,100**	**4,100**	**4,100**	**4,300**	**4,400**	**4,300**	**4,300**	**4,300**	**4,500**	**4,200**	**4,300**	**4,400**	**4,400**
Nitrous Oxide Emissions (kg)																	
Generation																	
Boundary Dam	115,300	118,500	124,900	120,700	136,400	138,800	138,300	139,600	142,800	145,000	145,100	152,400	149,400	140,000	145,400	148,400	144,300
Poplar River	107,700	106,700	110,800	102,900	103,600	105,800	102,900	108,600	109,200	104,500	106,000	103,400	105,200	105,800	104,800	97,100	104,500
Estevan	6,600	4,000	1,100														
Shand			20,000	46,700	51,800	48,000	52,300	53,100	51,900	53,200	47,400	51,100	52,600	52,300	51,400	51,900	51,800
Queen Elizabeth	3,200	3,400	8,000	4,600	6,500	6,800	5,700	11,100	14,500	13,100	11,900	10,100	13,900	11,900	12,700	17,000	15,800
Meadow Lake	300	600	1,700	600	700	1,300	1,500	1,300	3,100	1,800	1,200	500	1,800	600	700	1,100	1,000
Landis	400	100	500	300	300	600	800	1,300	2,200	900	1,500	2,000	4,300	1,700	2,000	3,200	3,400
Success	20	90	110	30	10		20	70	230	90	150	90	460	140	170	180	80
Northern Diesel[1]	250	240	20	20	80	30	30	40	20	50	50	50	50	50	50	50	50
Fleet Vehicles	1,000	1,000	1,000	1,000	1,000	1,000	900	800	700	700	700	700	600	600	600	600	600
Total Nitrous Oxide Emissions:	**234,770**	**234,630**	**268,130**	**276,850**	**300,390**	**302,330**	**302,450**	**315,910**	**324,650**	**319,340**	**314,000**	**320,340**	**328,310**	**313,090**	**317,820**	**319,530**	**321,530**
Total CO_2e : (tonnes)	**72,800**	**72,700**	**83,100**	**85,800**	**93,100**	**93,700**	**93,800**	**97,900**	**100,600**	**99,000**	**97,300**	**99,300**	**101,800**	**97,100**	**98,500**	**99,100**	**99,700**
Total CO_2e : (tonnes)	**10,082,500**	**10,078,800**	**11,532,600**	**11,906,000**	**12,926,500**	**13,002,900**	**13,013,000**	**13,611,100**	**13,997,800**	**13,760,400**	**13,528,000**	**13,802,300**	**14,160,200**	**13,494,600**	**13,701,600**	**13,787,900**	**13,875,700**

Notes: 1) Northern Diesel includes Brabant Lake and Southend (1990,1991) and Kinoosao (1990-Present)

2) CO2e Greenhouse Gases are sometimes expressed as an equivalent amount of CO_2, based on their Global Warming Potential CO_2=1, CH_4=23, N_2O=296

3) In 2001, past and present CO2 emissions for 'Cooling Water CO2 Injection' at Boundary Dam where cut in half. This is a result of the fact that only an estimated 50% of tonnes consumed gets released into the atmosphere.

GLOSSARY

Carbon dioxide equivalent (CO_2e)
A single unit of measurement used to calculate the impact of the various greenhouse gases. The conversion is based on the global warming potential of all greenhouse gases. $CO_2 = 1$, $CH_4 = 23$, $N_2O = 296$.

Cogeneration
The simultaneous generation of electricity and useful heat or steam.

Credit for early action
A system to credit verifiable early action prior to the first Kyoto Protocol commitment period as a further incentive to reduce GHG emissions.

Demand-side management (DSM)
Actions taken by a utility or other agency intended to influence the amount or timing of a customer's use of electricity.

Flyash
Residue left over when a fossil fuel such as coal is burned in a furnace.

Greenhouse gases (GHG)
Naturally-occurring gases such as carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) that trap heat in the earth's lower atmosphere.

Kilowatt hour (kW.h)
A unit of bulk energy. When a 100-watt bulb burns for 10 hours, it consumes one kilowatt-hour of energy.

Kyoto Protocol
An agreement reached in December 1997 that sets legally binding targets for GHG emission reductions. Canada has agreed to reductions 6% below 1990 emissions levels for 2008-2012 however the federal government is still debating ratification of the agreement.

Line losses
Loss of energy in the power system due to resistance in the transmission and distribution wires.

Megawatt (MW)
A unit of bulk power, equals 1,000 kilowatts or 1 million watts. A watt is a unit for measuring electric power.

Offsets
Compensation activities that reduce net greenhouse gas emissions. The compensation must reduce net atmospheric greenhouse gas emissions, and usually takes the form of funding for projects which are outside the normal scope of operations. Offsets allow for the market to determine the least expense method to reduce greenhouse gas emissions.

Sequestration
The enhanced removal and storage of carbon from the atmosphere through biological processes.

Tonne (t)
Equals 1,000 kilograms.

To learn more about SaskPower's environmental programs and initiatives, please visit our website or contact SaskPower Environmental Programs by phone (1-800-667-4749, toll-free in Saskatchewan) or mail at the address below.

SaskPower

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